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☐ 1: P00379. Dihydrofolate red...[gi:118974] BLink, Domains, Links

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LOCUS       P00379                  159 aa            linear   BCT 15-MAR-2004
DEFINITION  Dihydrofolate reductase.
ACCESSION   P00379
VERSION     P00379  GI:118974
DBSOURCE    swissprot: locus DYR_ECOLI, accession P00379;
            class: standard.
            created: Jul 21, 1986.
            sequence updated: Jul 21, 1986.
            annotation updated: Mar 15, 2004.
            xrefs: gi: 146005, gi: 146006, gi: 41264, gi: 41265, gi: 21321891,
            gi: 21321929, gi: 1786230, gi: 1786233, gi: 26106314, gi: 26106368,
            gi: 24050246, gi: 24050247, gi: 30039813, gi: 30039857, gi: 66098,
            pdb accession 4DFR, gi: 231129, gi: 231205, gi: 231252, pdb
            accession 1DRA, pdb accession 1DRB, pdb accession 2DRC, pdb
            accession 3DRC, pdb accession 1DHI, pdb accession 1DHJ, pdb
            accession 1DDR, pdb accession 1DDS, gi: 1942148, gi: 996100, pdb
            accession 1DYH, pdb accession 1DYI, pdb accession 1DYJ, pdb
            accession 1JOL, gi: 1943514, gi: 1942814, gi: 1942742, gi: 1942743,
            gi: 1941993, gi: 1942744, pdb accession 1RB2, pdb accession 1RB3,
            gi: 1942006, pdb accession 1RD7, pdb accession 1RE7, gi: 1942023,
            gi: 1942024, gi: 1942025, gi: 1942605, gi: 1942541, gi: 1942542,
            gi: 1942543, gi: 1942544, gi: 1942545, gi: 1942030, gi: 1942031,
            gi: 2098461, pdb accession 1TDR
            xrefs (non-sequence databases): SWISS-2DPAGEP00379,
            ECO2DBASEB020.0, EcoGeneEG10326, InterProIPR001796, PfamPF00186,
            PRINTSPR00070, PROSITEPS00075
KEYWORDS    Oxidoreductase; NADP; Trimethoprim resistance; Methotrexate
            resistance; One-carbon metabolism; 3D-structure; Complete proteome.
SOURCE      Escherichia coli
  ORGANISM  Escherichia coli
            Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
            Enterobacteriaceae; Escherichia.
REFERENCE   1  (residues 1 to 159)
  AUTHORS   Smith,D.R. and Calvo,J.M.
  TITLE     Nucleotide sequence of the E coli gene coding for dihydrofolate
            reductase
  JOURNAL   Nucleic Acids Res. 8 (10), 2255-2274 (1980)
  MEDLINE   81053692
   PUBMED   6159575
  REMARK    SEQUENCE FROM N.A.
            SPECIES=E.coli; STRAIN=K12
REFERENCE   2  (residues 1 to 159)
  AUTHORS   Yura,T., Mori,H., Nagai,H., Nagata,T., Ishihama,A., Fujita,N.,
            Isono,K., Mizobuchi,K. and Nakata,A.
  TITLE     Systematic sequencing of the Escherichia coli genome: analysis of
            the 0-2.4 min region
  JOURNAL   Nucleic Acids Res. 20 (13), 3305-3308 (1992)
  MEDLINE   92334977
   PUBMED   1630901
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REMARK SEQUENCE FROM N.A.
SPECIES=E.coli; STRAIN=K12
REFERENCE 3 (residues 1 to 159)
AUTHORS Blattner,F.R., Plunkett,G. III, Bloch,C.A., Perna,N.T., Burland,V., Riley,M., Collado-Vides,J., Glasner,J.D., Rode,C.K., Mayhew,G.F., Gregor,J., Davis,N.W., Kirkpatrick,H.A., Goeden,M.A., Rose,D.J., Mau,B. and Shao,Y.
TITLE The complete genome sequence of Escherichia coli K-12
JOURNAL Science 277 (5331), 1453-1474 (1997)
MEDLINE 97426617
PUBMED 9278503
REMARK SEQUENCE FROM N.A.
SPECIES=E.coli; STRAIN=K12 / MG1655
REFERENCE 4 (residues 1 to 159)
AUTHORS Welch,R.A., Burland,V., Plunkett,G. III, Redford,P., Roesch,P., Rasko,D., Buckles,E.L., Liou,S.-R., Boutin,A., Hackett,J., Stroud,D., Mayhew,G.F., Rose,D.J., Zhou,S., Schwartz,D.C., Perna,N.T., Mobley,H.L.T., Donnenberg,M.S. and Blattner,F.R.
TITLE Extensive mosaic structure revealed by the complete genome sequence of uropathogenic Escherichia coli
JOURNAL Proc. Natl. Acad. Sci. U.S.A. 99 (26), 17020-17024 (2002)
MEDLINE 22388234
PUBMED 12471157
REMARK SEQUENCE FROM N.A.
SPECIES=E.coli; STRAIN=O6:H1 / CFT073 / ATCC 700928
REFERENCE 5 (residues 1 to 159)
AUTHORS Stone,D., Phillips,A.W. and Burchall,J.J.
TITLE The amino-acid sequence of the dihydrofolate reductase of a trimethoprim-resistant strain of Escherichia coli
JOURNAL Eur. J. Biochem. 72 (3), 613-624 (1977)
MEDLINE 77115802
PUBMED 320005
REMARK SEQUENCE (ISOZYME 1).
SPECIES=E.coli; STRAIN=B [RT500]
REFERENCE 6 (residues 1 to 159)
AUTHORS Baccanari,D.P., Stone,D. and Kuyper,L.
TITLE Effect of a single amino acid substitution on Escherichia coli dihydrofolate reductase catalysis and ligand binding
JOURNAL J. Biol. Chem. 256 (4), 1738-1747 (1981)
MEDLINE 81117257
PUBMED 7007370
REMARK SEQUENCE (ISOZYME 2).
SPECIES=E.coli; STRAIN=B [RT500]
REFERENCE 7 (residues 1 to 159)
AUTHORS Bennett,C.D., Rodkey,J.A., Sondey,J.M. and Hirschmann,R.
TITLE Dihydrofolate reductase: the amino acid sequence of the enzyme from a methotrexate-resistant mutant of Escherichia coli
JOURNAL Biochemistry 17 (7), 1328-1337 (1978)
MEDLINE 78187252
PUBMED 350268
REMARK SEQUENCE.
SPECIES=E.coli; STRAIN=B [MB1428]
REFERENCE 8 (residues 1 to 159)
AUTHORS Flensburg,J. and Skold,O.
TITLE Massive overproduction of dihydrofolate reductase in bacteria as a response to the use of trimethoprim
JOURNAL Eur. J. Biochem. 162 (3), 473-476 (1987)
MEDLINE 87161813
PUBMED 3549289
REMARK SEQUENCE FROM N.A.

SPECIES=E.coli; STRAIN=1810
REFERENCE 9 (residues 1 to 159)
AUTHORS Jin,Q., Yuan,Z., Xu,J., Wang,Y., Shen,Y., Lu,W., Wang,J., Liu,H., Yang,J., Yang,F., Zhang,X., Zhang,J., Yang,G., Wu,H., Qu,D., Dong,J., Sun,L., Xue,Y., Zhao,A., Gao,Y., Zhu,J., Kan,B., Ding,K., Chen,S., Cheng,H., Yao,Z., He,B., Chen,R., Ma,D., Qiang,B., Wen,Y., Hou,Y. and Yu,J.
TITLE Genome sequence of Shigella flexneri 2a: insights into pathogenicity through comparison with genomes of Escherichia coli K12 and O157
JOURNAL Nucleic Acids Res. 30 (20), 4432-4441 (2002)
MEDLINE 22272406
PUBMED 12384590
REMARK SEQUENCE FROM N.A.
SPECIES=S.flexneri; STRAIN=301 / Serotype 2a
REFERENCE 10 (residues 1 to 159)
AUTHORS Wei,J., Goldberg,M.B., Burland,V., Venkatesan,M.M., Deng,W., Fournier,G., Mayhew,G.F., Plunkett,G. III, Rose,D.J., Darling,A., Mau,B., Perna,N.T., Payne,S.M., Runyen-Janecky,L.J., Zhou,S., Schwartz,D.C. and Blattner,F.R.
TITLE Complete genome sequence and comparative genomics of Shigella flexneri serotype 2a strain 2457T
JOURNAL Infect. Immun. 71 (5), 2775-2786 (2003)
MEDLINE 22590274
PUBMED 12704152
REMARK SEQUENCE FROM N.A.
SPECIES=S.flexneri; STRAIN=2457T / ATCC 700930 / Serotype 2a
REFERENCE 11 (residues 1 to 159)
AUTHORS Filman,D.J., Bolin,J.T., Matthews,D.A. and Kraut,J.
TITLE Crystal structures of Escherichia coli and Lactobacillus casei dihydrofolate reductase refined at 1.7 A resolution. II. Environment of bound NADPH and implications for catalysis
JOURNAL J. Biol. Chem. 257 (22), 13663-13672 (1982)
MEDLINE 83056868
PUBMED 6815179
REMARK X-RAY CRYSTALLOGRAPHY (1.7 ANGSTROMS).
SPECIES=E.coli
REFERENCE 12 (residues 1 to 159)
AUTHORS Bystroff,C., Oatley,S.J. and Kraut,J.
TITLE Crystal structures of Escherichia coli dihydrofolate reductase: the NADP+ holoenzyme and the folate.NADP+ ternary complex. Substrate binding and a model for the transition state
JOURNAL Biochemistry 29 (13), 3263-3277 (1990)
MEDLINE 90241903
PUBMED 2185835
REMARK X-RAY CRYSTALLOGRAPHY.
SPECIES=E.coli
REFERENCE 13 (residues 1 to 159)
AUTHORS Bystroff,C. and Kraut,J.
TITLE Crystal structure of unliganded Escherichia coli dihydrofolate reductase. Ligand-induced conformational changes and cooperativity in binding
JOURNAL Biochemistry 30 (8), 2227-2239 (1991)
MEDLINE 91152037
PUBMED 1998681
REMARK X-RAY CRYSTALLOGRAPHY (2.3 ANGSTROMS).
SPECIES=E.coli
COMMENT ----------
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            the EMBL outstation - the European Bioinformatics Institute.
            The original entry is available from http://www.expasy.ch/sprot
            and http://www.ebi.ac.uk/sprot
            ----------------------------------------------------------------.
            [CATALYTIC ACTIVITY] 5,6,7,8-tetrahydrofolate + NADP(+) =
            7,8-dihydrofolate + NADPH.
            [PATHWAY] Essential step for de novo glycine and purine synthesis,
            DNA precursor synthesis, and for the conversion of dUMP to dTMP.
            [MISCELLANEOUS] The strain K12 sequence is shown.
            [MISCELLANEOUS] STRAIN B [RT500] IS RESISTANT TO 500 MICROGRAMS PER
            MILLILITER OF TRIMETHOPRIM.
            [MISCELLANEOUS] STRAIN B [MB1428] IS METHOTREXATE-RESISTANT.
            [SIMILARITY] Belongs to the dihydrofolate reductase family.
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